Claims

1. A method of detecting and rejecting faulty cigarettes, where cigarettes are arranged in horizontal layers in channels of a packing machine feeding system and move gravitationally toward the bottom plate from which they are transferred to the packing machine, and faulty cigarettes are detected with sensors defining their defects and rejected by a rejecting device, characterized in that while the cigarettes are stopped in the channels, which takes place between consecutive cycles of transferring cigarettes from the bottom plate to the packing machine, the cigarettes are inspected in all channels of the feeding system with use of movable sensors moving with reciprocating movement along a determined trajectory, whereby the movable sensors are coupled with the rejecting device and detection and rejection of faulty cigarettes takes place along the same trajectory along which the movable sensors are moved.

2. A method as claimed in Claim 1, characterized in that the distance between the trajectory and the bottom plate is constant for all channels and corresponds with the same number of cigarettes located in the channels between the bottom plate and the trajectory.

3. A method as claimed in Claim 1, characterized in that the distance between the trajectory and the bottom plate is not constant for all channels and corresponds with different number of cigarettes located in the channels between the bottom plate and the trajectory.

4. A method as claimed in Claim 1, characterized in that rejection of a faulty cigarette is executed in the same place where the faulty cigarette has been detected.

5. A method as claimed in Claim 4, characterized in that in case of multiple systems feeding a packing machine, the activities are executed independently for each feeding system with use of a set of sensors and a rejecting device autonomous for each feeding system.

6. A method as claimed in Claim 4, characterized in that in case of multiple systems feeding a packing machine, the activities are executed for all feeding systems with use of one common set of sensors and a rejecting device.

7. A method as claimed in Claim 1, characterized in that the cigarette loose end detection is executed with use of a sensor located near the cigarette opened end, and the detection of improperly attached filter is executed with use of a sensor located near the filter end, whereas both sensors are coupled, and the cigarette is inspected at its both ends simultaneously.

8. A method as claimed in Claim 1 or 7, characterized in that the sensors constitute photo-optical elements.

9. A method as claimed in Claim 1 or 7, characterized in that the sensors operate within blacklight.

10. A method as claimed in Claim 1, characterized in that the rejecting device constitutes a pneumatic nozzle.

11. A method as claimed in Claim 1, characterized in that the rejecting device comprises two pneumatic nozzles placed symmetrically on both sides of the movable sensor.

12. A method as claimed in Claim 11, characterized in that a faulty cigarette is rejected by the pneumatic nozzle following the movable sensor, irrespectively of the direction of the sensor movement.

13. A method as claimed in Claim 1 or 7, characterized in that the rejection of a faulty cigarette is delayed with reference to the detection moment, which is a result of the time needed to replace the sensor with the rejecting device.

14. A method as claimed in Claim 1, characterized in that two-phase aligning of cigarette ends is realized in order to assure constant distance between the sensors and cigarettes.

15. A method as claimed in Claim 14, characterized in that the first aligning phase is realized with use of an independent aligning element.

16. A method as claimed in Claim 14, characterized in that the second aligning phase is realized with use of an aligning mechanism coupled with the sensors and the rejecting device.

17. A method as claimed in Claim 1, characterized in that between two consecutive cycles of transfering the bottom layer of cigarettes from the bottom plate to the packing machine at least one detection and rejection cycle is executed, whereas each next detection and rejection cycle may be started after filling the gap after the rejected faulty cigarette with a cigarette delivered from the upper layer.

18. A method as claimed in Claim 17, characterized in that the cycles of detection and rejection of faulty cigarettes can be executed without breaks, excluding the time when cigarettes drop in channels by one layer.

19. A method as claimed in Claim 1, characterized in that in order to verify the correctness of the operation of the movable sensors, two reference elements are placed at the level of their operation, one of the reference elements corresponds with features of a good quality cigarette and the other one corresponds with features of a faulty cigarette, whereas the reference elements are inspected by the sensors during the reciprocating movement.

20. A method as claimed in Claim 19, characterized in that the reference elements constitute a good quality cigarette and a faulty cigarette respectively.